Small Business Innovation Research

Single Crystal Oxide Fibers: EFG Processing of Optical, Piezoelectric and Structural Materials

Advanced Crystal Products Corporation
Woburn, MA

INNOVATION

Computer controlled Edge Defined Film Fed Growth (EFG) Crystal Furnace-Puller for processing single crystal continuous fibers of various functional and structural oxides

ACCOMPLISHMENTS

- Designed & developed computer controlled EFG Furnace-Puller with data acquisition capability for single and multiple growth of oxide fibers
- Grew single crystal fibers of optical materials such as Lithium Niobate
- Grew single crystal fibers of piezoelectric materials such as Sodium Bismuth Titanate
- Grew single crystal (and eutectics) of Sapphire, YAG and other structural materials for use in composites
- Designed and built new hot zone capable of use in air or oxidizing atmosphere to 1600C to complement existing graphite 2300C inert atmosphere hot zones

COMMERCIALIZATION

- Sales to date – approximately $250K EFG system sold to MIT

EFG Furnace-Puller during growth of fibers

GOVERNMENT/SCIENCE APPLICATIONS

- NASA and the Department of Defense would have interest in using this technology to process research and prototype quantities of novel functional materials
- Foster-Miller Inc., Waltham, MA, has expressed interest in a larger system for their development of innovative ceramic composites and photonic materials

1992 Phase II, NAS3-27306, 4/01
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